REMARKS

In view of the foregoing amendments and the following remarks, reexamination, reconsideration, and allowance of the above-captioned application is respectfully requested.

Initially, the Examiner is thanked for initialing and returning a copy of the Information Disclosure Statement submitted on September 8, 2000, and for indicating that the certified copies of the priority application have been received from the International Bureau.

Drawings

It is noted that there is no indication in the Office Action that the drawings have been reviewed for adequacy. The Examiner is respectfully requested to include in the next Office Action an indication that the drawings are acceptable.

Objection to the Specification

Page 2 of the Office Action set forth an objection to the Specification as not including an Abstract of the Disclosure. An Abstract of the Disclosure is attached as a separate sheet hereto, and withdrawal of the objection is respectfully requested.

Rejection under 35 U.S.C. § 112, second paragraph

Page 2 of the Office Action set forth a rejection of Claims 1-8 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the Applicant regards as the invention.

Applicant respectfully submits that the claims, as preliminarily amended on September 8, 2003, are clear and understandable to one of ordinary skill in the art when read in light of the specification. Nonetheless, Claims 1-8 have been amended to address

each of the concerns identified by the Office Action. No change in claim scope is intended. Accordingly, it is respectfully submitted that Claims 1-8 are in compliance with 35 U.S.C. § 112, second paragraph, and the Examiner is respectfully requested to withdraw the rejection under 35 U.S.C. § 112, second paragraph.

Prior Art Rejections

Claims 1 and 3-5 have been rejected under 35 U.S.C. § 102(b), as allegedly being anticipated by, and therefore unpatentable over, the disclosure of U.S. Patent No. 5,528,222, to *Moskowitz et al.* Claims 2 and 6-7 have been rejected under 35 U.S.C. § 103(a), as allegedly being obvious, and therefore, being unpatentable over, the disclosure of *Moskowitz et al.* Applicant respectfully requests reconsideration of these rejections.

Claim 1 is directed to a method for manufacturing a contactless smart card including an integrated-circuit chip and an antenna. The method comprises producing metallised protrusions on two contact pads on the chip and connecting the chip to the antenna by embedding the metallised protrusions in a thickness of the antenna at the time that the chip is connected to the antenna.

It is noted that *Moskowitz et al.* is the priority document for PCT application WO 96/07985, which is discussed at page 2 of the specification of the present application. *Moskowitz et al.* is concerned with producing a thin and flexible radio frequency tag having a semiconductor circuit and an antenna. The antenna 230 is a thin copper line which has either been etched onto a copper/organic laminate or plated on the organic surface. The copper surface of the *Moskowitz et al.* antenna may be gold or tin plated to facilitate bonding. See column 3, lines 65-68 and column 4, lines 5-8. *Moskowitz et al.* discloses

that the chip 210 can be attached to the antenna 230 in several ways. First, the chip 210 can be soldered to the antenna 230. In this case, the bumps 225 will be C4 solder, and will liquify and bond to the surface of the copper antenna 230. If the copper antenna is gold or tin plated, the C4 solder bumps 225 will liquify and bond to the gold or tin layer on the surface of the copper antenna 230. Thus, the *Moskowitz et al.* solder bumps 225 are not embedded into a thickness of the antenna. Instead, the *Moskowitz et al.* chip 210 has merely been solder bonded to the surface of the antenna 230.

Moskowitz et al. also discloses that the chp 210 can be bonded to the copper antenna lines 230 by thermocompression bonding of plated gold bumps 225 to the copper antenna lines 230. In this method, the plated gold bumps and the tin or gold plate on the copper antenna will be bonded together at the surface of the copper antenna lines 230. There is no disclosure in *Moskowitz et al.* that the plated gold bumps 225 will be embedded into the thickness of the antenna 230. Therefore, this second method of *Moskowitz et al.* also does not disclose embedding a metallized protrusion into the thickness of an antenna.

For at least the foregoing reasons, *Moskowitz et al.* does not disclose a method having all the features of independent Claim 1. Thus, *Moskowitz et al.* cannot anticipate Claim 1, and withdrawal of the rejection of Claim 1 under 35 U.S.C. §102(b) is respectfully requested.

The dependent Claims 2-8 are believed to be allowable over *Moskowitz et al.* for at least the same reasons that Claim 1 is allowable. Nonetheless, in order to expedite prosecution, a few comments regarding several of the dependent claims are provided.

Page 4 of the Office Action set forth a rejection of Claim 5 based on *Moskowitz et al.*, pointing to column 6, lines 1-6 as disclosing a process including thermcompression. However, Claim 5 recites producing the antenna from a non-polymerized conductive material, connecting the chip to the antenna by compression, and polymerizing the antenna material by applying heat. *Moskowitz et al.* fails to disclose at least the step of polymerizing the antenna material. Nor does it appear that the *Moskowitz et al.* copper antenna lines could be polymerized.

Page 4 of the Office Action sets forth a rejection of Claim 2 under 35 U.S.C. §103(a) as being unpatentable over *Moskowitz et al.* Claim 2 recites the step of producing the antenna from a material having a viscous state at the time that the chip is attached, to allow the embedding of the metallised protrusions.

As acknowledged by the Office Action, *Moskowitz et al.* does not disclose the antenna being produced from a material that has a viscous ~~state at~~ the time the chip is attached to allow the embedding of the metallised protrusions. The Office Action asserts that "it would have been an obvious matter of design choice to choose any desired material and its properties since applicant has not disclosed that the claimed viscous state would solve any stated problem or is for any particular purpose and it appears that the invention would perform equally well with the conventional antenna structure taught by *Moskowitz et al.*" Applicant respectfully disagrees.

First, the specification of the present application clearly identifies the advantages of the claimed method. As set forth in the specification, the viscous state of the antenna at the time the chip is attached to the antenna allows the chip to be attached to the antenna by

simply compressing the protrusions on the chip into the viscous antenna material. This is followed by a step of drying in ambient air to harden the antenna. See column 5, lines 10-16. This method has the advantage of not requiring application of heat in order to attach the chip to the antenna. In contrast, each of the *Moskowitz et al.* methods require heat to melt the gold or solder bumps 225 to bond to the antenna surface or plating on the antenna surface. The applicants describe several problems with the *Moskowitz et al.* method at page 2 of the specification. As described in the specification, the hot compression of the *Moskowitz et al.* method can cause problems of mechanical strength and tensile fragility. The methods of the present application are intended to overcome these problems.

Further, in order to support a prima facie case of obviousness, a motivation to make the suggested modification must be present. Further, this suggestion must be found in the references themselves, or in the prior art, not in the applicants' disclosure. The Office Action has not identified any motivation in *Moskowitz et al.* to replace the copper antenna lines with "a material that has a viscous state at the time the chip is attached to allow the embedding of the metallised protrusions", as set forth in Claim 2. Any such suggestion of a method set forth in Claim 2 can only be found in the applicant's specification itself.

Therefore, the mere assertion in the Office Action that it would have been an "obvious matter of design choice" to modify *Moskowitz et al.* cannot support a *prima facie* case of obviousness. Accordingly, Claim 2 is believed to be patentably distinct over the disclosure of *Moskowitz et al.*, and withdrawal of the rejection of Claim 2 under 35 U.S.C. §103(a) is respectfully requested.

Claim 6 sets forth the step of producing the antenna from a moist conductive polymer material, and connecting the chip to the antenna by compression. As acknowledged by the Office Action, *Moskowitz et al.* does not disclose producing the antenna from a moist conductive polymer material, and connecting the chip to the antenna by compression. The Office Action asserts merely that "it would have been an obvious matter of design choice to choose any desired material and its properties since applicant has not disclosed that the claimed viscous state would solve any problem or is for any particular purpose and it appears that the invention would perform equally well with the conventional antenna structures taught by *Moskowitz et al.*. Applicant respectfully disagrees.

The specification of the present application sets forth several purposes for producing the antenna from a moist conductive polymer material. As set forth in Claim 6 itself and at page 5, lines 10-16 of the specification, the protrusions can be embedded into the moist conductive polymer material of the antenna by simply compressing the protrusions into the thickness of the antenna. Next, as set forth at page 9, lines 3-13, simply leaving the interconnection block to dry in ambient air will harden the antenna material so that an addition of heat is not necessary. This simplifies the manufacturing process considerably. Additional comparisons with the *Moscowitz et al.* process are found in the specification at page 2. Accordingly, the purpose of the claimed feature is clearly stated in the specification.

Nor does the Office Action identify any motivation in *Moskowitz et al.* to replace the copper antenna material with a moist conductive polymer material. Any such motivation can only be found in the applicant's specification itself. Therefore, the assertion in the

Office Action that modifying the *Moskowitz et al.* antenna material would be a mere matter of design choice, without more, does not support a *prima facie* case of obviousness.

Claim 7 recites the steps of producing the antenna from a thermoplastic material loaded with metallic particles and gluing the chip to an insulating sheet having a form factor of the smart card, and connecting the chip to the antenna by hot lamination. Although the Office Action acknowledges that none of these claimed steps are disclosed in *Moskowitz et al.*, the Office Action asserts that it would have been "an obvious matter of design choice" to modify the *Moskowitz et al.* antenna and chip attachment technique to include the features of Claim 7. Applicant respectfully disagrees.

As disclosed at page 9, line 29 through page 10, line 30 of the specification, the hot lamination method has several advantages. First, attachment of the chip to the antenna and lamination of insulating sheets on either side of the antenna and chip can be accomplished in a single step. Further, this step produces a finished contactless smart card having the desired shape. Further, this method provides an ultrafine thickness of the card produced by the method of Claim 7. Finally, as set forth at page 11, lines 11-15, protrusions being completely embedded in the thickness of the antenna lessens the chance that the connections will be damaged by mechanical stresses encountered by such ultrathin smart cards. The heat of the hot lamination both softens the thermoplastic material of the antenna to allow the protrusions to be embedded into the softened antenna material, and hot laminates the plastic sheets together. Thus, the specification clearly sets forth the purpose and advantages of the method of Claim 7.

Nor does the Office Action identify any motivation in *Moscowitz et al.* to replace the copper antenna lines with a thermoplastic material loaded with metallic particles, to glue the chip to an insulating sheet having a form factor of the smart card, and to connect the chip to the antenna by hot lamination, as set forth in Claim 1.

Therefore, the Office Action's assertion that it would have been obvious to modify the *Moskowitz et al.* technique to have the features of Claim 7, without more, is insufficient to support a *prima facie* case of obviousness.

For at least the foregoing reasons, Claims 1-8 are believed to be allowable over *Moskowitz et al.* Therefore, the Examiner is respectfully requested to withdraw the rejections of Claims 1-8 based on *Moskowitz et al.* and to indicate the allowability of the claims.

Should the Examiner have any questions regarding this Amendment, or about the application in general, the Examiner is cordially invited to contact the undersigned at the number listed below to expedite prosecution of the application.

Respectfully submitted,

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